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NCBC DAVISVILLE
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TRANSMITTAL LETTER REGARDING THE FINAL SAMPLING AND ANALYSIS PLAN FOR
THE TPH DELINEATION AT CED AREA SITE 03 AND ADDITIONAL GROUNDWATER
SAMPLING AT SITES 02 AND 03 AND THE DRUM REMOVAL AREA FORMER NCBC
DAVISVILLE RI
09/15/2014
DEPARTMENT OF THE NAVY



DEPARTMENT OF THE NAVY
BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE, NORTHEAST
4911 SOUTH BROAD STREET
PHILADELPHIA, PA 19112-1303

5090
Ser BPMOE/14-222
September 15, 2014

Mr. David Reis
Rhode Island Coastal Resources Management Council
4808 Tower Hill Road
Wakefield, Rhode Island 02879

Dear Mr. Reis:

Enclosed please find one compact disk (CD) copy of the Final Sampling and Analysis Plan (SAP) for the TPH Delineation at CED Area Site 03 and Additional Groundwater Sampling at Sites 02 and 03 and the Drum Removal Area to be conducted at Construction Equipment Department (CED) Area at the former Naval Construction Battalion Center (NCBC) Davisville, North Kingstown, Rhode Island. The document describes the field investigations anticipated to be completed at the CED Area during the autumn of 2014. The attached Coastal Zone Consistency Determination, enclosure 1, was completed for the proposed work in accordance with Title 15 of the Code of Federal Regulations, Part 930 Subpart C, Consistency for Federal Activities to the extent consistent with 42 U.S.C. section 9621(e)(1). The Navy has determined this action is consistent with the Rhode Island Coastal Resources Plan to the maximum extent practicable.

Per your request, we have presented relevant figures, tables, and text portions of the Final SAP in enclosure 2 to facilitate your review. Please note that the Final SAP for the CED Area has been reviewed and approved by both EPA Region I (Ms. Christine Williams, Project Manager) and the Rhode Island Department of Environmental Management (Mr. Richard Gottlieb, Project Manager). This work is expected to commence during autumn of 2014.

If you have any questions regarding the SAP or concerns regarding the planned investigative work for CED Area Site 03, please contact me at (617) 753-4656. Thank you in advance for your review of our documents.

Sincerely,

A handwritten signature in black ink, appearing to read "David Barney", is written over the typed name.

DAVID BARNEY
BRAC Environmental Coordinator
By direction of BRAC PMO

Enclosures:

1. Coastal Management Consistency Review, Former NCBC Construction Center, Davisville, TPH Delineation at CED Area Site 03 and Additional Groundwater Sampling at Sites 02 and 03 and the Drum Removal Area and Attachment A (Relevant Figures, Tables, and Text from SAP [Enclosure 1]).
2. Final Sampling and Analysis Plan (SAP) for the TPH Delineation at CED Area Site 03 and Additional Groundwater Sampling at Sites 02 and 03 and the Drum Removal Area, Former NCBC Davisville, North Kingstown, Rhode Island, August 2014, Tetra Tech [Enclosure 2].

Copy to:

U.S. EPA Region I (C. Williams)

RIDEM (R. Gottlieb)

MIDLANT (J. Dale)

Quonset Development Corporation (S. King)

Town of North Kingstown (J. Reiner)

Tetra Tech (J. Trepanowski, G. Glenn, S. Anderson, L. Sinagoga)

Tetra Tech Project Files (CTO WE01, 112G01813)

NIRIS RDM

ATTACHMENT A OF ENCLOSURE 1

**RELEVANT TABLES, FIGURES, AND TEXT FROM FINAL SAP FOR TPH
DELINEATION AT CED AREA SITE 03 AND ADDITIONAL GROUNDWATER
SAMPLING AT SITES 02 AND 03 AND
THE DRUM REMOVAL AREA**

PROJECT DESCRIPTION

The Construction Equipment Department (CED) Area Site 03 (i.e., the area encompassing Sites 02/03, Study Areas 01/04, and the Drum Removal Area) is located within Zone 3 of the Former NCBC Davisville facility (Figure 4-1, Attachment A) and will be referred to as the CED Area throughout this document to avoid confusion when specifically referencing Site 03 *within* the CED Area Site 03. The NCBC Davisville CED Area features and boundaries are depicted in Figure 4-2. Site 02 is a previously paved flat area bordered by Warren Street on the south and Sayers Street on the west. The site consisted of a former dry well and leaching field and does not include Building 224. Site 02 is bounded to the east by the approximate location of the eastern edge of former Building 224, to the north by Battalion Boulevard, to the south by MW02-11S, and the west by Site 03 (Figure 4-4). Site 03 (within the CED Area) is an unmarked previously paved lot located west of former Building 224 and Sayers Street and south of Battalion Boulevard. Site 03 is bounded (approximately) to the east by Site 02, to the north by Battalion Boulevard, and to the south by Parade Road, and the western boundary is approximately 95 feet west of the approximate location of MW03-03S (Figure 4-4). The Drum Removal Area is located in the northwestern corner of the CED Area (Figure 4-2), approximately 200 feet north of Study Area 04 and approximately 200 feet south of the bike path located along Perimeter Road; Seabee Avenue is located immediately west (Figure 4-4).

The field investigation detailed in the enclosed Sampling and Analysis Plan (SAP) will include (among other tasks) the collection of soil samples within the Site 03 boundary, the installation of less than six shallow groundwater monitoring wells in the immediate vicinity of existing Sites 02/03 monitoring wells, and the sampling of previously-installed/new wells within the Site 02, Site 03, and Drum Removal Area boundaries. There is no significant environmental habitat present within the project area and it is anticipated that much of the area is likely to be developed for commercial purposes in the future.

A description and overview of most the investigative program scheduled for Sites 02/03 and the Drum Removal Area and the soil and groundwater samples to be collected are provided in Worksheet 7 and Table 8-1 of the SAP (included in Attachment A). Based on recent field visits (conducted post the preparation of the referenced SAP), it has been determined that a few of the existing Site 02/03 groundwater monitoring wells selected for sampling (as specified in the attached SAP) have been damaged (e.g., MW02-06S, MW03-01S) and may need to be replaced. Such wells will be replaced, as necessary, using the methodology presented in the drilling specification also presented in

Attachment A. Soil sampling locations are depicted in Figure 4-3, and monitoring well sampling locations are depicted in Figure 4-4. Investigative tasks involve the advancement of soil borings at Site 03, the installation of shallow monitoring wells at Sites 02/03 (to replace damaged wells, as necessary), and sampling of monitoring wells at Sites 02/03 and the Drum Removal Area. These tasks are described in Attachment A. However, no significant wetlands have been delineated in the CED Area. In summary, the following investigative tasks will be performed at the CED Area:

- ***Site 03 Total Petroleum Hydrocarbon (TPH) Delineation*** – A total of 35 soil borings will be advanced at Site 03 as depicted on Figure 4-3. The soil borings will be approximately 10 feet deep.
- ***Groundwater Sampling***. Groundwater will be sampled from 17 existing wells at Sites 02/03 and 6 newly-installed wells at the Drum Removal Area (Figure 4-4). As noted above, a few existing wells at Sites 02/03 have been damaged and may need to be replaced.

APPLICABLE SECTIONS OF THE COASTAL RESOURCES MANAGEMENT PROGRAM (CRMP)

The project is located in an area that is contiguous to coastal features (e.g., Allen Harbor [see Figure 4-2]). The applicable sections for project type are listed below.

Section 300. In Tidal and Coastal Pond Waters, on Shoreline Features and Their Contiguous Areas

Section 300.1 Category B Requirements

This project is necessary to support the Focused Feasibility Study (FFS) for CED Area soils and a human health risk assessment (HHRA) for Drum Removal Area groundwater required by Navy/EPA/State regulation and policy. Ultimately, the planned investigation and subsequent environmental restoration, as necessary, will also promote productive reuse of property. The project will not:

- Result in significant impacts on erosion and/or deposition processes along the coastal shorelines or in tidal waters.
- Result in significant impacts on the abundance and diversity of plant and animal life.
- Unreasonably interfere with, impair, or significantly impact existing access to, or use of, tidal waters and/or the shore.
- Result in significant impacts to water circulation, flushing, turbidity, and sedimentation.

- Result in significant deterioration in the quality of the water in the immediate vicinity as defined by the Department of Environmental Management.
- Result in significant impacts to areas of historic and archaeological significance.
- Result in the significant conflicts with water-dependent uses and activities such as recreational boating, fishing, swimming, navigation, and commerce.
- Result in adverse scenic impact.

Section 300.2 Filling, Removing, or Grading of Shoreline Features

As indicated in Figure 4-3, the *soil borings* planned for Site 03 are not located at the shoreline. However, these borings are located within the CED Area, which is not adjacent to the coast but is within a municipality (North Kingstown) adjacent to the coast. These soil borings will be advanced (to approximately 10 feet below ground surface [bgs] as described in Attachment A) for purposes of subsurface sample collection only. Previously-installed *monitoring wells (or replacement wells* installed as described in Attachment A) to be sampled are also located within CED Area boundaries (not along the shoreline). The depth of any of the replacement wells will not exceed 50 feet bgs. Excess groundwater and soils generated as a consequence of the soil borings/monitoring well installation/sampling will be collected and treated as IDW in accordance with RIDEM and EPA requirements.

For access and health and safety reasons, light clearing/grubbing of the underbrush/pruning of tree limbs may be necessary to reach the selected boring locations/monitoring wells within the CED Area. However, the subcontractor conducting the test boring installation has been instructed (in the bid documents, see Attachment A) to keep any clearing to a minimum, to reduce environmental impacts. That subcontractor has also been instructed (in the bid documents, see Attachment A) to take all necessary measures to minimize disturbance and degradation of the site, and that temporary erosion and sedimentation controls (hay bales) may be required. Disturbed areas will be re-seeded at the conclusion of the investigation, as necessary.

The soil borings/monitoring well sampling at the CED Area will be in compliance with the standards and policies stated in Section 300.2 of the CRMP to the maximum extent practicable.

Section 300.12 Coastal Wetland Mitigation.

There are no significant wetlands in the CED Area. Given the limited nature of the drilling planned for Site 03 and the subcontractor specifications described above and in Attachment A, the proposed work will be compliance with the standards and policies stated in Section 300.12 of the CRMP to the maximum extent practicable. No adverse wetlands impact is anticipated. No wetlands mitigation is required.

DETERMINATION

The project will not significantly impact current environmental resources at the CED Area or alter future development of Rhode Island's coastal resources. In accordance with 15 CFR 930 Subpart C, Consistency for Federal Activities, we have determined this action is consistent to the maximum extent practicable with the Rhode Island Coastal Management Plan.

7.0 -- Sampling Design and Rationale

(UFP-QAPP Manual Section 3.1.1 – Worksheet #17)

[Worksheet #7](#) summarizes the sampling design, which identifies the sampling locations, media to be sampled, and analyses. Sampling locations are illustrated on [Figure 4-3](#) for soil and [Figure 4-4](#) for groundwater, and a table of samples is provided in [Table 8-1](#). Soil borings will be advanced using DPT (macrocore samplers) to collect surface and subsurface soil samples. Sampling and other field task methodologies are described in [Worksheet #8](#).

7.1 SOIL BORINGS AT SITE 03

For soil sample location selection at Site 03 (Problem Statement 1), a grid encompassing the areal extent of known TPH contamination was established based on a 50-foot by 50-foot grid spacing. A soil boring will be advanced at each selected grid node shown on [Figure 4-3](#); however, some grid nodes (boring locations) were adjusted to allow for resampling of previous locations at which TPH concentrations exceeded RIDEM criteria. Therefore, both “biased samples” (i.e., samples from locations with previous TPH exceedances) and “grid samples” (i.e., samples collected from locations on the grid where no historical samples were collected) will be collected to confirm historical sampling results and to delineate the horizontal extent of contamination.

A DPT rig will be used to advance a shallow soil boring at each of the 35 locations depicted on [Figure 4-3](#) (03SB001 through 03SB035). Four soil samples will be collected from each soil boring location, one surface soil (0 to 2 feet bgs) and three subsurface soil (2 to 4 feet bgs, 4 to 6 feet bgs, and 6 to 10 feet bgs) samples. Samples from all depth intervals will be screened in the field using a PID (for the potential presence of volatile organic chemicals) and visually examined for the presence of staining, etc. All samples will be submitted to the subcontract analytical laboratory for TPH-diesel-range organics (DRO) (C9-C40) and TPH-GRO (MTBE through naphthalene) analysis.

The analytical laboratory will analyze the top two depth intervals (0 to 2 feet bgs and 2 to 4 feet bgs) from all boring locations for TPH-DRO (C9-C40) and TPH-GRO (MTBE through naphthalene); samples from the deeper depth intervals will be placed on hold pending instructions from Navy/Tetra Tech. The subcontract laboratory will submit the raw (unvalidated) data for the 0- to 2- and 2- to 4-foot depth intervals via e-mail to the Navy/Tetra Tech for review as soon as the raw data are available. Soil samples from the deeper depth intervals will be analyzed for TPH-DRO (C9-C40) and TPH-GRO (MTBE through naphthalene) only as instructed by the Navy/Tetra Tech. The Navy/Tetra Tech will select soil samples from deeper depths (4 to 6 and 6 to 10 feet bgs) for fixed-base laboratory analysis based on: (1) the field observations, (2) field screening results, and (3) evaluation of raw TPH-DRO (C9-C40) and TPH-GRO

(MTBE through naphthalene) data for the 0- to 2- and 2- to 4-foot depth intervals. The intent is to analyze the deeper intervals only if necessary to complete the vertical delineation of contamination. The decision not to automatically analyze all soil depth intervals was based on an expectation that very few locations need to be investigated to depths greater than approximately 4 feet bgs because the contamination at Site 03 is likely to be the result of surface releases based on the CSM (see [Section 4.1](#)).

The soil sample design for Site 03, consisting of biased locations selected based on historical data and locations selected using a grid, will result in a sample density that is relatively high. Consequently, the need for additional data collection is expected to be low (unless it is due to data quality deficiencies), and any required additional data collection could be accomplished as the initial step of any removal action necessary under RIDEM regulations.

7.2 GROUNDWATER SAMPLES

[Table 7-1](#) provides the primary rationale for the selection of monitoring wells to be sampled to address Problem Statement Nos. 2 and 3. For Site 02, wells downgradient of where naphthalene was previously detected in subsurface soil (MW02-04S and MW02-10S) were selected for sampling. VOC contamination was also detected at MW02-10S in samples collected in 2007. Additionally, well 25MW-01S at Site 02 was selected for sampling primarily because previous VOC contamination was detected at this well. For Site 03, wells downgradient of Site 03 (MW03-04S and MW03-05S) were selected for sampling primarily because TPH soil contamination was detected at locations scattered across Site 03. Additional wells across Sites 02 and 03 (listed in [Table 7-1](#)) were also recommended for sampling to obtain adequate spatial coverage of the sites and to provide data needed to address remaining concerns regarding the potential for migration of metals from soil to groundwater. Regardless of the primary reason for sampling at a particular Site 02/03 well, samples from all of the selected wells will be analyzed for the same target analyte list (specified in [Table 8-1](#)).

[Table 7-1](#) also includes three wells (MW01-10S, MW01-13S, and MW01-14S) selected for sampling to provide data regarding CED-area-specific upgradient conditions, particularly for metals. These wells were selected as potentially unimpacted wells because they are located upgradient and/or distal from the CED source areas and, based on historical data, contained very low-level VOC and metals contamination. These wells will be sampled for the same target analyte list as the other CED Area wells (specified in [Table 8-1](#)).

[Table 7-1](#) also identifies each of the six newly installed monitoring wells at the CED Drum Removal Area that will be sampled to characterize water quality at and downgradient of the area where drums were excavated (Problem No. 4). Monitoring wells MW03-17S and MW03-17I are located in the immediate

vicinity of the drum excavation area, and monitoring wells MW03-16S and MW03-16I are located downgradient of the excavation area, as shown on [Figure 4-4](#). Monitoring wells MW03-15S and MW03-15I are likely installed sidegradient of the drum excavation area, although it is possible given the presence of wetland features to the north of the site that these wells could be seasonally downgradient of the excavation area (especially MW03-15S). The following table briefly summarizes the rationale for the screen depth interval selected for each new well.

CED Drum Removal Area Well	Screened Interval (feet bgs)	Rationale for Screened Interval
MW03-15S	13 to 23	Characterize shallow groundwater/water table zone. Evaluate potential shallow migration to north.
MW03-15I	45 to 55	Characterize intermediate groundwater zone. Evaluate potential migration from shallow zones to deeper zones. Evaluate potential intermediate migration to north and/or migration from shallow zone.
MW03-16S	11.5 to 21.5	Characterize shallow groundwater/water table zone and potential migration downgradient of excavation area.
MW03-16I	45 to 55	Characterize intermediate groundwater zone. Evaluate potential migration from shallow zones to deeper zones and potential migration downgradient of excavation area.
MW03-17S	11.5 to 21.5	Characterize shallow groundwater/water table zone in the excavation area (potential source area).
MW03-17I	45 to 55	Characterize intermediate groundwater zone. Evaluate potential migration from shallow zones to deeper zones in the excavation area (potential source area)

Installation of these wells is beyond the scope of this SAP (i.e., the document does not provide the DQOs or specifications for well installation). The preceding information is provided for purposes of completeness and to facilitate regulatory review. Depth to groundwater is estimated to be between 15 and 20 feet bgs in this area based on boring logs completed during well installation in early February 2014. The target analyte list for the fixed-base laboratory samples to be collected from these newly installed wells is specified in [Table 8-1](#) and is more extensive than the analyte list specified for the existing wells.

Water quality parameters will be measured and logged in the field for all existing and newly installed wells sampled. These parameters include DO, specific conductance, temperature, pH, ORP, and turbidity. Water level measurements will be collected from each well at the time of sample collection.

A total of 17 existing shallow wells at Sites 02/03 (listed in [Table 7-1](#)) will be sampled. Fourteen of the shallow wells are associated with Sites 02 and 03 and will be sampled to characterize groundwater at these sites and to support the FFS for CED Area soils. Three additional wells, upgradient and/or distal

from these sites, will be sampled to provide CED Area-specific upgradient data. All groundwater samples from these wells will be analyzed for TCL VOCs, naphthalene, target analyte list (TAL) metals (total and dissolved), and TPH-DRO (C9-C40) and TPH-GRO (MTBE through naphthalene). Groundwater samples collected from the newly installed wells at the Drum Removal Area will be sampled for TCL SVOCs and TCL pesticides/PCBs in addition to the parameters listed above for existing wells.

TABLE 7-1

WELLS IDENTIFIED FOR ADDITIONAL SAMPLING

Well ID	Primary Rationale for Sampling
MW01-10S, MW01-13S and/or MW01-14S ⁽¹⁾	Based on historical data, very low-level VOC concentrations and low metals concentrations only. Recommended to potentially provide data regarding CED-area-specific upgradient conditions, particularly for metals.
25MW-01S ⁽¹⁾	VOC contamination previously detected.
MW02-04S ⁽¹⁾	Recommended primarily for naphthalene sampling. Naphthalene was detected in sample 02-B15-04-6-8 in Site 02 subsurface soil. This well is likely downgradient of location 02-B15-04-6-8. MTBE detected in 2007 samples.
MW02-05S ⁽¹⁾	Recommended primarily for metals sampling. MW02-05S is likely downgradient of metals concentrations in Site 02 surface soil exceeding refined groundwater protection criteria and facility background concentrations (e.g., 02-B17-01). MTBE detected in 2007 sample.
MW02-06S ⁽¹⁾	Recommended primarily for metals sampling. MW02-06S is likely downgradient from metals concentrations exceeding refined groundwater protection criteria (e.g., 02-B15-01).
MW02-08S ⁽¹⁾	Recommended primarily for metals sampling. MW02-08S is likely downgradient of elevated concentrations of some metals in Site 02 subsurface soil (detected at B-02-08-04-S and B-02-10-08-S) and maximum concentrations of some metals in Site 02 subsurface soil (detected at B-02-10-04-S). Some metals concentrations in Site 02 subsurface soil exceeded refined groundwater protection criteria and facility background concentrations.
MW02-09S ⁽¹⁾	Recommended primarily for metals sampling. MW02-09S is likely downgradient of maximum metals concentration in Site 02 surface soil (detected at 02-B17-01). Metals concentrations in Site 02 surface soil exceeded refined groundwater protection criteria and facility background concentrations.
MW02-10S ⁽¹⁾	Recommended primarily for naphthalene sampling. Naphthalene was detected in sample 02-B15-04-6-8 in Site 02 subsurface soil. This well is downgradient of location 02-B15-04-6-8. VOC contamination detected in 2007 samples.
MW03-01S ⁽¹⁾	Recommended primarily for metals sampling. MW03-05S is downgradient of maximum concentrations of some metals in Site 03 surface soil (detected at S-03-03-00-S and B-03-02-06-S). Some metals concentrations in Site 03 surface soil exceeded refined groundwater protection criteria and facility background concentrations.
MW03-02S ⁽¹⁾	Recommended primarily for metals sampling. MW03-02S is co-located with maximum concentrations of some metals in Site 03 subsurface soil. Some metals concentrations in Site 03 subsurface soil exceeded refined groundwater protection criteria and facility background concentrations.
MW03-04S ⁽¹⁾	Recommended primarily for TPH sampling. TPH concentrations exceeding groundwater protection criteria were scattered across Site 03 (i.e., locations SS3C-1 and S-03-01-00-S through S-03-10-00-S). This well is likely downgradient of Site 03. Available shallow groundwater samples do not include TPH results.

Well ID	Primary Rationale for Sampling
MW03-05S ⁽¹⁾	Recommended primarily for TPH sampling. TPH concentrations exceeding groundwater protection criteria are scattered across Site 03 (i.e., locations SS3C-1 and S-03-01-00-S through S-03-10-00-S). This well is likely downgradient of Site 03. Available shallow groundwater samples do not include TPH results.
MW03-03S ⁽¹⁾	Added at the suggestion of USEPA Region I to further characterize the nature and extent of any groundwater contamination in the CED Area.
MW02-11S ⁽¹⁾	Added at the suggestion of USEPA Region I to further characterize the nature and extent of any groundwater contamination in the CED Area.
MW02-03S ⁽¹⁾	Added at the suggestion of USEPA Region I to further characterize the nature and extent of any groundwater contamination in the CED Area.
All New Drum Area Wells ⁽²⁾	Recommended in support of drum removal investigation to the northwest of existing CED Area sites.

- Existing wells to be sampled for TCL VOCs, naphthalene, TAL metals (total and dissolved), and TPH-DRO (C9-C40) and TPH-GRO (MTBE through naphthalene).
- New drum area wells to be sampled for TAL metals (total and dissolved) and TCL VOCs, SVOCs, pesticides/PCBs, and TPH-DRO (C9-C40) and TPH-GRO (MTBE through naphthalene).

Table 8-1 – Sample Details Table

(UFP-QAPP Manual Section 3.1.1 and 3.5.2.3 – Worksheet #s 18, 19, 20, and 30)

Sample Location	Sample ID ⁽¹⁾	Analyses
Soil - Problem No. 1		
03SB001	03SS0010002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0010204	
	03SB0010406	
	03SB0010610	
03SB002	03SS0020002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0020204	
	03SB0020406	
	03SB0020610	
03SB003	03SS0030002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0030204	
	03SB0030406	
	03SB0030610	
03SB004	03SS0040002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0040204	
	03SB0040406	
	03SB0040610	
03SB005	03SS0050002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0050204	
	03SB0050406	
	03SB0050610	
03SB006	03SS0060002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0060204	
	03SB0060406	
	03SB0060610	
03SB007	03SS0070002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0070204	
	03SB0070406	
	03SB0070610	
03SB008	03SS0080002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0080204	
	03SB0080406	
	03SB0080610	
03SB009	03SS0090002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0090204	
	03SB0090406	
	03SB0090610	
03SB010	03SS0100002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0100204	
	03SB0100406	
	03SB0100610	

Sample Location	Sample ID ⁽¹⁾	Analyses
03SB011	03SS0110002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0110204	
	03SB0110406	
	03SB0110610	
03SB012	03SS0120002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0120204	
	03SB0120406	
	03SB0120610	
03SB013	03SS0130002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0130204	
	03SB0130406	
	03SB0130610	
03SB014	03SS0140002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0140204	
	03SB0140406	
	03SB0140610	
03SB015	03SS0150002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0150204	
	03SB0150406	
	03SB0150610	
03SB016	03SS0160002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0160204	
	03SB0160406	
	03SB0160610	
03SB017	03SS0170002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0170204	
	03SB0170406	
	03SB0170610	
03SB018	03SS0180002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0180204	
	03SB0180406	
	03SB0180610	
03SB019	03SS0190002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0190204	
	03SB0190406	
	03SB0190610	
03SB020	03SS0200002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0200204	
	03SB0200406	
	03SB0200610	
03SB021	03SS0210002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0210204	
	03SB0210406	
	03SB0210610	
03SB022	03SS0220002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0220204	
	03SB0220406	
	03SB0220610	

Sample Location	Sample ID ⁽¹⁾	Analyses
03SB023	03SS0230002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0230204	
	03SB0230406	
	03SB0230610	
03SB024	03SS0240002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0240204	
	03SB0240406	
	03SB0240610	
03SB025	03SS0250002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0250204	
	03SB0250406	
	03SB0250610	
03SB026	03SS0260002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0260204	
	03SB0260406	
	03SB0260610	
03SB027	03SS0270002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0270204	
	03SB0270406	
	03SB0270610	
03SB028	03SS0280002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0280204	
	03SB0280406	
	03SB0280610	
03SB029	03SS0290002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0290204	
	03SB0290406	
	03SB0290610	
03SB030	03SS0300002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0300204	
	03SB0300406	
	03SB0300610	
03SB031	03SS0310002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0310204	
	03SB0310406	
	03SB0310610	
03SB032	03SS0320002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0320204	
	03SB0320406	
	03SB0320610	
03SB033	03SS0330002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0330204	
	03SB0330406	
	03SB0330610	
03SB034	03SS0340002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0340204	
	03SB0340406	
	03SB0340610	

Sample Location	Sample ID ⁽¹⁾	Analyses
03SB035	03SS0350002	TPH-GRO (MTBE through naphthalene) and TPH-DRO (C9-C40)
	03SB0350204	
	03SB0350406	
	03SB0350610	

Groundwater from Existing Wells - Problem Nos. 2 and 3

MW01-10S	MW01-10S-NWG-XXXX14	TCL VOCs, naphthalene, TAL metals (total and dissolved), TPH-GRO (MTBE through naphthalene), TPH-DRO (C9-C40)
MW01-13S	MW01-13S-NWG-XXXX14	
MW01-14S	MW01-14S-NWG-XXXX14	
25MW01-S	25MW01-S-NWG-XXXX14	
MW02-04S	MW02-04S-NWG-XXXX14	
MW02-05S	MW02-05S-NWG-XXXX14	
MW02-06S	MW02-06S-NWG-XXXX14	
MW02-08S	MW02-08S-NWG-XXXX14	
MW02-09S	MW02-09S-NWG-XXXX14	
MW09-10S	MW09-10S-NWG-XXXX14	
MW03-01S	MW03-01S-NWG-XXXX14	
MW03-02S	MW03-02S-NWG-XXXX14	
MW03-04S	MW03-04S-NWG-XXXX14	
MW03-05S	MW03-05S-NWG-XXXX14	
MW03-03S	MW03-03S-NWG-XXXX14	
MW02-11S	MW02-11S-NWG-XXXX14	
MW02-03S	MW02-03S-NWG-XXXX14	

Groundwater from New Wells - Problem No. 4

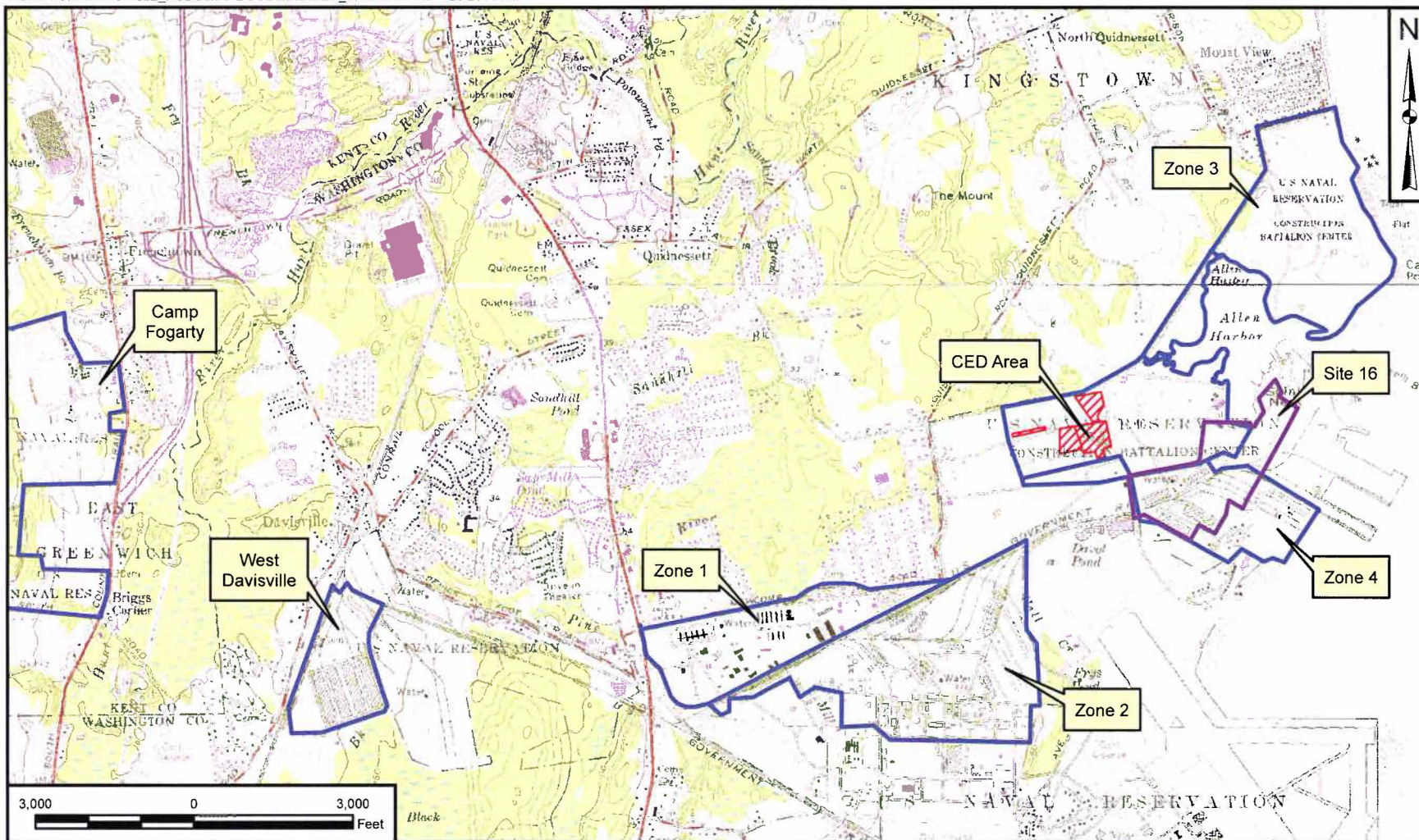
MW03-15S	MW03-15S-NWG-XXXX14	TCL VOCs, SVOCs, and pesticides/PCBs, TAL metals (total and dissolved), TPH-GRO (MTBE through naphthalene), and TPH- DRO (C9-C40)
MW03-15I	MW03-15I-NWG-XXXX14	
MW03-16S	MW03-16S-NWG-XXXX14	
MW03-16I	MW03-16I-NWG-XXXX14	
MW03-17S	MW03-17S-NWG-XXXX14	
MW03-17I	MW03-17I-NWG-XXXX14	


- 1 For soil, sample IDs are the sample location followed by the depth interval (e.g., 0002 for the 0- to 2-foot depth interval); for groundwater, the date of sampling will be added to the end of the sample IDs (represented by “-XXXX14” in the table above).

CMRC – Enclosure 1
NCBC Davisville CED Area Site 03
September 2014

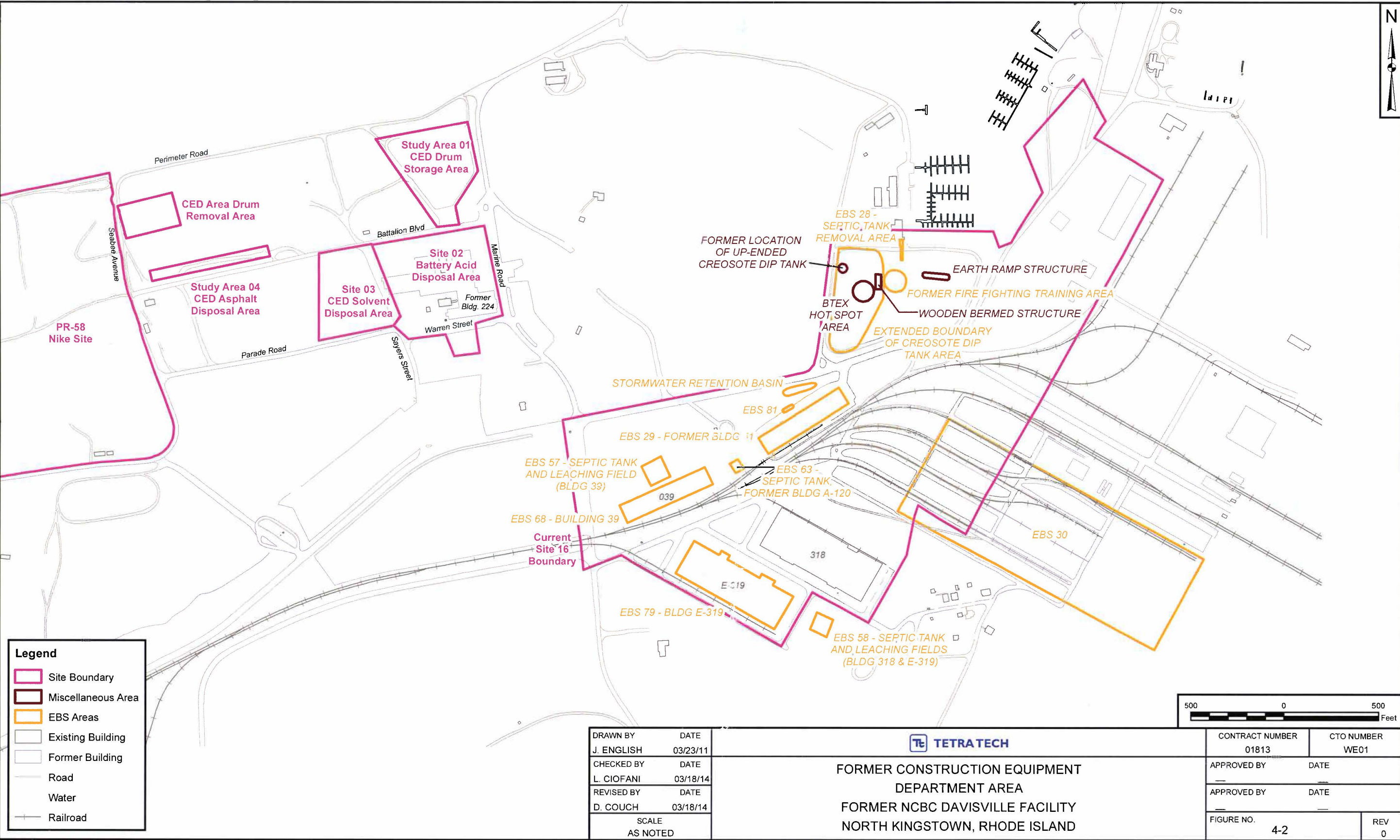
ENCLOSURE (1)

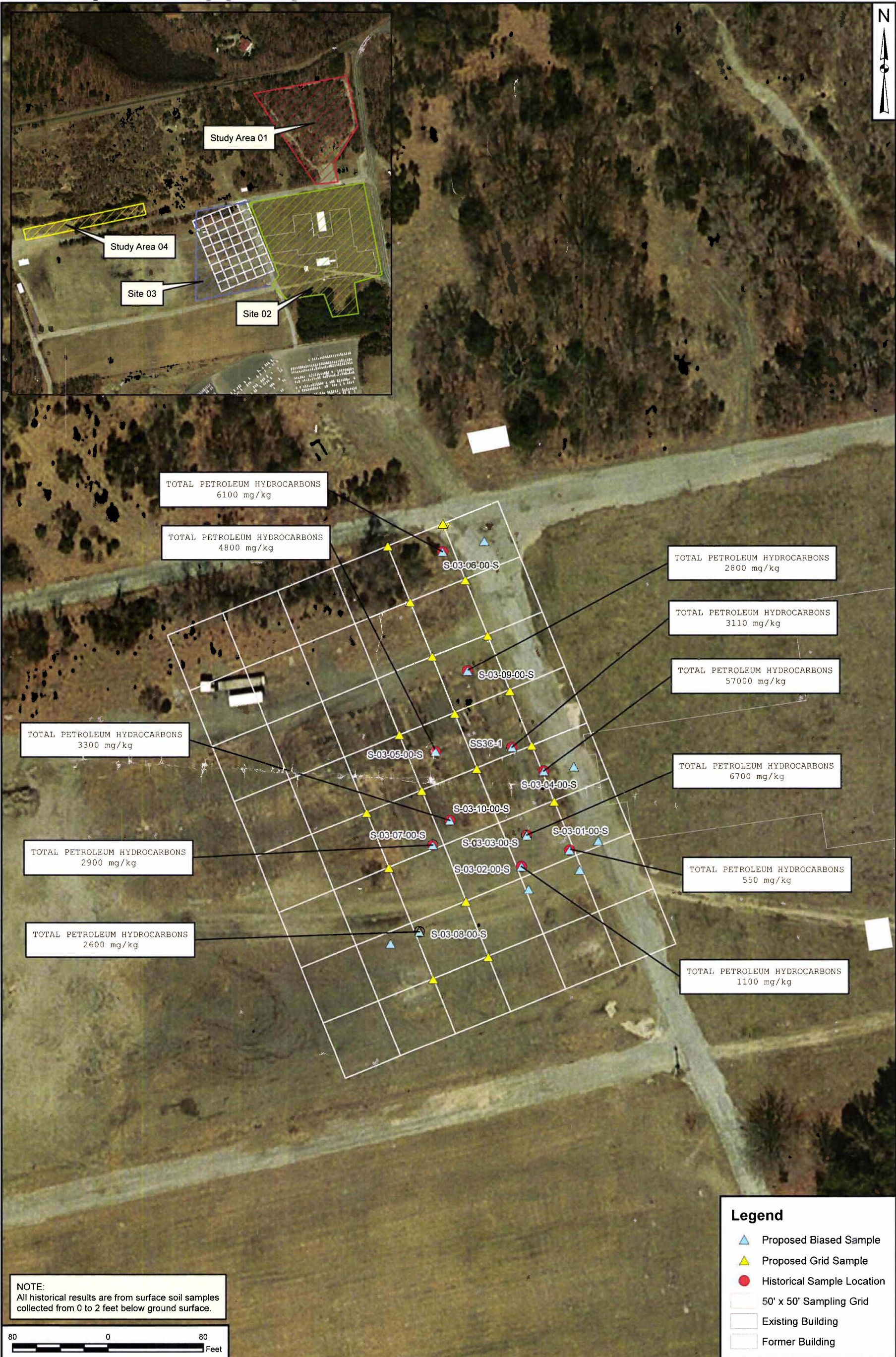
**COASTAL MANAGEMENT CONSISTENCY REVIEW (CMCR)
FORMER NAVAL CONSTRUCTION BATTALION CENTER (NCBC) DAVISVILLE
TOTAL PETROLEUM HYDROCARBON (TPH) DELINEATION AT
THE CONSTRUCTION EQUIPMENT DEPARTMENT (CED) AREA SITE 03 AND
ADDITIONAL GROUNDWATER SAMPLING AT SITES 02 AND 03 AND
THE DRUM REMOVAL AREA**



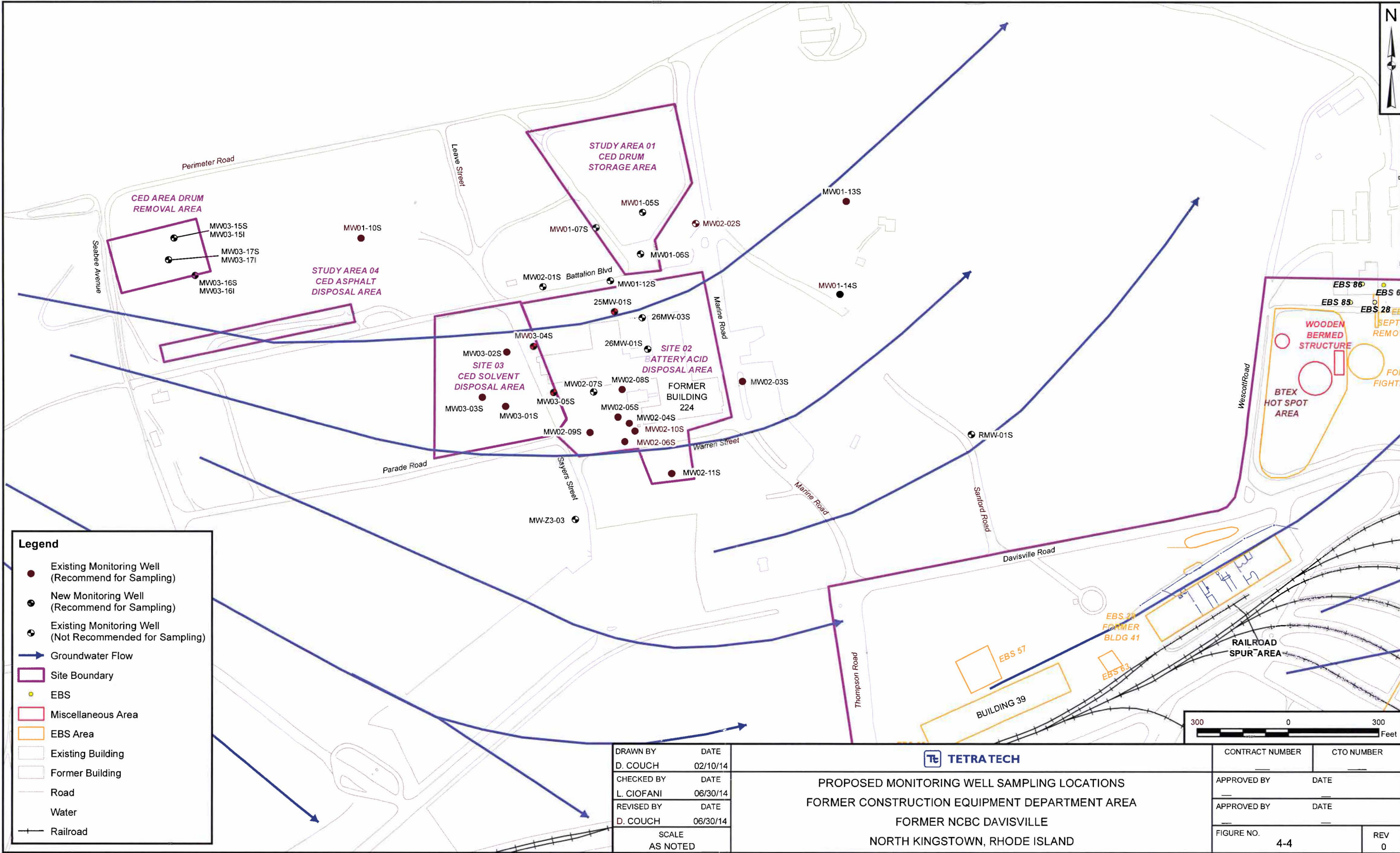
DRAWN BY J. ENGLISH	DATE 03/23/11	 TETRA TECH	CONTRACT NUMBER 01813	
CHECKED BY L. CIOFANI	DATE 04/28/14		APPROVED BY —	DATE —
REVISED BY	DATE		APPROVED BY	DATE
SCALE AS NOTED			FIGURE NO. FIGURE 4-1	REV 0

SITE LOCATION MAP
FORMER CONSTRUCTION EQUIPMENT DEPARTMENT (CED) AREA
FORMER NCBC DAVISVILLE FACILITY
NORTH KINGSTOWN, RHODE ISLAND





DRAWN BY J. NOVAK	DATE 03/05/13	<div>TETRA TECH</div> <div>HISTORICAL TPH CONCENTRATIONS AND PROPOSED SAMPLING LOCATIONS AT SITE 03</div> <div>FORMER CONSTRUCTION EQUIPMENT DEPARTMENT AREA</div> <div>FORMER NCBC DAVISVILLE</div> <div>NORTH KINGSTOWN, RHODE ISLAND</div>	CONTRACT NUMBER	CTO NUMBER
CHECKED BY L. CIOFANI	DATE 04/29/14		APPROVED BY	DATE
REVISED BY	DATE		APPROVED BY	DATE
D. COUCH	04/29/14		FIGURE NO.	REV
SCALE AS NOTED			4-3	0



DRAWN BY	DATE
D. COUCH	02/10/14
CHECKED BY	DATE
L. CIOFANI	06/30/14
REVISED BY	DATE
D. COUCH	06/30/14
SCALE	
AS NOTED	

TETRA TECH	
PROPOSED MONITORING WELL SAMPLING LOCATIONS	
FORMER CONSTRUCTION EQUIPMENT DEPARTMENT AREA	
FORMER NCBC DAVISVILLE	
NORTH KINGSTOWN, RHODE ISLAND	

CONTRACT NUMBER	CTO NUMBER
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
4-4	0

TECHNICAL SPECIFICATION

DRILLING SERVICES

**TPH DELINEATION OF SOILS AT CED AREA SITE 03
FORMER NAVAL CONSTRUCTION BATTALION CENTER
DAVISVILLE, RHODE ISLAND**

**FOR
NAVAL FACILITIES ENGINEERING COMMAND
MID-ATLANTIC**

**BY
TETRA TECH, INC.**

**CONTRACT NUMBER N62470-08-D-1001
"CLEAN" CONTRACT TASK ORDER NO. WE01**

SEPTEMBER 2014

At the end of each day, the Subcontractor's representative and the Tetra Tech representative will complete a Daily Activity Form (provided by Tetra Tech) detailing the day's activities, including a record of quantities for each of the pay items identified on the Price Schedule. Both parties will sign the sheet and the quantities on the sheet will be the basis for invoicing. Any unresolved issues related to pay items between the Tetra Tech representative and the Subcontractor's representative will be brought to the attention of the Tetra Tech Project Manager.

2.2 SITE ACCESS AND PREPARATION

The drilling sites at Site 03 are located in fairly open areas. All locations will be staked or marked by Tetra Tech prior to Subcontractor's mobilization to the Site. In addition, the Navy, QDC, and Tetra Tech will be responsible for having utility clearances performed and all utilities in the drilling areas clearly marked. If any proposed drilling location is determined to be inaccessible or there are questions concerning the locations of buried utilities, then the Tetra Tech FOL, in consultation with the Tetra Tech Project Manager, will select an alternative location.

Physical access to drilling locations may involve minor brush clearing. The Subcontractor is responsible for this activity. Clearing of any brush for ease of physical access to the drilling locations is left to the discretion of the Subcontractor, in consultation with the Tetra Tech FOL. Any clearing shall be held to a minimum, to reduce environmental impacts. The Subcontractor shall stack cleared vegetation at an on-site location to be approved of by the Tetra Tech Site Representative. It is anticipated that only minimal clearing will be needed to access a few boring locations.

The Subcontractor shall also take all measures necessary to minimize disturbance and degradation of the Site. The Subcontractor shall provide and install temporary erosion and sediment control features, if necessary. The Subcontractor shall not enter wet or soft areas unless it is unavoidable. Mats will be required for access to wet or soft areas. However, it is not anticipated that wet or soft areas will be present.

Figure 3 depicts the location of the soil borings to be advanced at the Site.

2.3 DIRECT PUSH TECHNOLOGY DRILLING

This task includes drilling through the overburden material (up to approximately 10 feet deep) as necessary (sampling locations are shown on Figure 3). Overburden drilling shall be accomplished using DPT. In all cases, borehole diameters shall be a minimum of 3.25-inches. It is assumed that 3.25-inch probe rods will be used and new acetate liners will be used for each boring and depth. While not

anticipated based on site conditions encountered during previous investigations, failure to reach appropriate depths may occur. If this occurs, the location will be off-set up to 10 feet and re-drilled. Up to 3 attempts will be made to drill to the appropriate depths. If after 3 attempts the total depth cannot be reached, the Tetra Tech FOL will consult with Navy to determine if the boring should be eliminated. Additionally, if recovery of subsurface material is poor, multiple DPT holes may be needed.

Upon recovery, the Subcontractor will cut open the acetate liner for Tetra Tech personnel. TETRA TECH WILL NOT CUT OPEN THE ACETATE SLEEVES. Tetra Tech personnel will instruct collection of boring locations and depths to facilitate subsurface sampling activities. Tetra Tech will screen and log the lithologies at each location and return the unused materials to the Subcontractor for disposal.

Only minimal drill cuttings are anticipated based on the drilling technique proposed (and anticipated sampling activities). When drill cuttings are produced, they shall be containerized in drums, or other non-spill temporary containment. The Subcontractor shall periodically transport these wastes to a centralized IDW storage location, where the drill cuttings will be staged in drums. The Subcontractor shall also collect and containerize all groundwater produced during drilling, and decontamination fluids, and periodically transport the liquid IDW to a centralized storage location where it will be emptied into a poly tank, Baker tank, or other suitable storage container, as directed by Tetra Tech.

*

2.4 DOWNHOLE METHODS TO ASSIST WITH WELL DEVELOPMENT (CONTINGENT)

Approximately 23 existing groundwater monitoring wells are planned to be sampled by Tetra Tech (Figure 4). Since many wells at the Site have not been sampled in over 3 years, they are being re-developed by Tetra Tech personnel during the first half of September.

It is commonly observed that excessive siltation can occur in groundwater monitoring wells. Further, many attempts prove futile in removing this fine-grained material from the bottom of the wells. Since the wells being sampled are shallow groundwater monitoring wells, it may be necessary to remove the fine-grained materials in order to provide sufficient saturated thicknesses in the well for groundwater sampling.

As such, Tetra Tech may seek assistance in removing the fine-grained materials from the bottom of the wells at up to 10 locations. No specific method for removal is anticipated, though it is generally thought that use of a drive point or small diameter augers may be used to loosen the material (high pressure jetting has not proven successful in the past) to facilitate removal. Tetra Tech will provide the Subcontractor with required information such as measured depth to bottom, original depth to bottom and apparent thickness of the sediment buildup.

All produced sediments and water will be containerized in drums, or other non-spill temporary containment. The Subcontractor shall periodically transport these wastes to a centralized IDW storage location.

*

2.5

MONITORING WELL INSTALLATION (CONTINGENT)

If during the well re-development efforts it is deemed that the wells will be unusable yet a well is still required to be sampled in order to achieve the project goals, approximately 2 to 6 permanent monitoring wells may be installed. Wells will be installed at pre-determined depths adjacent to the existing unusable wells. Therefore, it is not anticipated that continuous cores will be collected to determine lithologies. Locations and depths of the wells will be provided by Tetra Tech.

The wells shall be constructed of 1.5-inch diameter, Schedule 40, flush joint, PVC riser pipe and slotted screen, pre-packed Geoprobe® wells. Geoprobe® equivalent 1.5-inch diameter may be acceptable (please submit specifications with bid) but no diameters less than 1.5-inches are permissible. In each overburden monitoring well, the screen is anticipated to be 10 feet long (connection of 2 5-foot long pre-packed screens is assumed), have a slot size of 0.010 inch (factory slotted) and installed to depths shallower than 30 feet below ground surface. Each well will consist of enough solid riser pipe(s) above so that the riser will extend approximately 2.5 feet above the ground surface. All riser pipe and screen sections will be new and certified clean.

A non-reactive silica sand filter pack (20/40 sieve size – or equivalent with pre-packed well) will be placed at least 2 feet (but not more than 3 feet) above the top of the well screen. Two feet of bentonite chips (bentonite seal) will be placed above the sandpack, and they will be allowed to hydrate per the manufacturer's recommendations and expand before grout is added to the hole. If applicable and appropriate, pre-designed filter packs (grout barrier) and bentonite well seal may be used above the pre-packed well screens. The remainder of the well annulus will be filled up to the ground surface with bentonite chips to the ground surface.

The drill rig and all down-hole equipment shall be steam cleaned/pressure washed upon completion of each monitoring well.

The monitoring wells shall be completed as above-ground monitoring wells with an outer, aluminum protective casing to be installed around the PVC casing. The outer casing will be installed at least 2 feet below the ground surface and no more than 4 inches above the inner PVC well cap and have a total height of approximately 3 feet. The aluminum casing shall have a hinged cap or removable cap, and will be set plumb. A 6-inch-thick, 2-foot by 2-foot concrete surface pad shall be placed around the well at the ground surface. The Subcontractor shall drill a ¼-inch drain hole through the outer protective casing that is approximately one inch above the concrete in the annulus. If appropriate, the well will be completed as a flush mount. Tetra Tech will inform the Subcontractor if flush mounts are to be used.